

# 11+ Maths Practice Paper

## Year 5 · Intermediate

### Lesson 5.2: Spatial and non-verbal sequences

#### Read this with your child:

1. This paper has **24 questions** in two parts. Work through them in order. The questions get harder as you go.
2. **Part 1** is multiple choice. Choose **one** answer, A, B, C, D or E, and mark it on the separate answer sheet by drawing a firm line through the box next to its letter. If you change your mind, rub the line out completely and mark your new answer.
3. **Part 2** asks you to write your answer. Write it in the boxes on the answer sheet, **one digit in each box**, starting from the left.
4. If a question is hard, leave it and come back to it at the end.
5. You may use rough paper for working out. You may **not** use a calculator.
6. Suggested time: **30 minutes**.

The answer sheet is after the questions. The answers, with a short explanation of each, are at the back for a parent to mark with.

*These are original practice questions written by Elite Learners in the style of 11+ entrance tests. They are not produced by, or connected with, GL Assessment or Cambridge University Press & Assessment (CEM).*

## Example

Here are some patterns made of matchsticks.

**How many matchsticks will Pattern 5 have?**



Pattern 1



Pattern 2



Pattern 3

**A** 13

**B** 9

**C** 11

**D** 10

**E** 15

**Answer: C** Each new triangle needs 2 more matchsticks: 3, 5, 7, 9, 11.

*The answer, C, has already been marked on your answer sheet.*

**Now turn over and start Part 1.**

## Part 1: Multiple choice

1

Here are some patterns made of matchsticks.

How many more matchsticks does each new pattern need?



Pattern 1



Pattern 2



Pattern 3

A 11

B 6

C 4

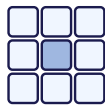
D 5

E 1

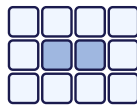
2

A garden path has grey tiles in a row, with white tiles all round.

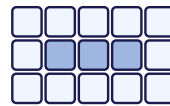
How many white tiles will Pattern 4 have?



Pattern 1



Pattern 2



Pattern 3

A 18

B 14

C 13

D 16

E 12

3

The arrow turns an eighth of a turn clockwise each time.

Which arrow comes next?



A



B



C



D



E



4

Here are some patterns made of matchsticks.

Which rule gives the number of matchsticks in any pattern?



Pattern 1



Pattern 2



Pattern 3

- A 3 times the pattern number, then add 4
- B 4 times the pattern number
- C 3 times the pattern number
- D add 3 each time
- E 3 times the pattern number, then add 1

5

Here are some squares made of tiles.

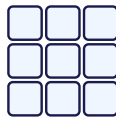
How many tiles will Pattern 5 have?



Pattern 1



Pattern 2



Pattern 3

- A 20
- B 23
- C 16
- D 25
- E 10

6

The shaded part moves round the square.

Which picture comes next?

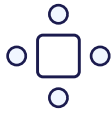


- A
- B
- C
- D
- E

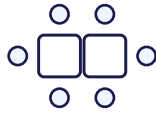
7

Square tables are pushed together in a row. Chairs go all the way round.

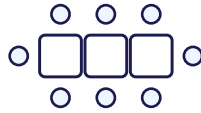
**How many chairs are there round 20 tables?**



Pattern 1



Pattern 2



Pattern 3

**A** 22

**B** 80

**C** 40

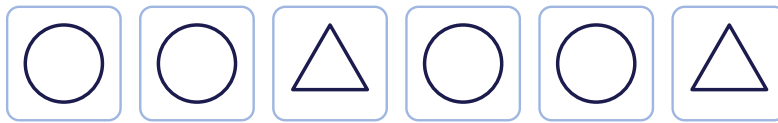
**D** 44

**E** 42

8

This pattern keeps repeating.

**What is the 20th shape?**



9

Here are some triangles made of dots.

**How many dots will Pattern 5 have?**



Pattern 1



Pattern 2



Pattern 3

**A** 13

**B** 15

**C** 25

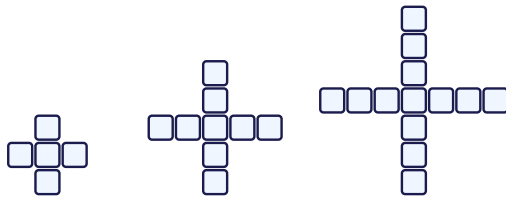
**D** 12

**E** 14

# 10

Here are some patterns made of tiles.

**How many tiles will Pattern 10 have?**



Pattern 1

Pattern 2

Pattern 3

**A** 50

**B** 45

**C** 37

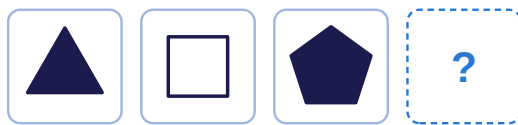
**D** 41

**E** 40

# 11

Two things change in this pattern.

**Which shape comes next?**



# 12

Here are some patterns made of matchsticks.

**Which pattern uses exactly 40 matchsticks?**



Pattern 1



Pattern 2



Pattern 3

**A** Pattern 20

**B** Pattern 12

**C** Pattern 13

**D** Pattern 14

**E** Pattern 10

# 13

Here is a pattern of dots.

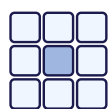
**Which picture is missing?**



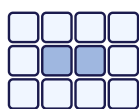
14

A garden path has grey tiles in a row, with white tiles all round.

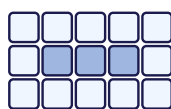
How many white tiles will Pattern 20 have?



Pattern 1



Pattern 2



Pattern 3

A 26

B 40

C 52

D 48

E 46

15

Here are some patterns made of matchsticks.

How many matchsticks will Pattern 10 have?



Pattern 1



Pattern 2



Pattern 3

A 51

B 60

C 50

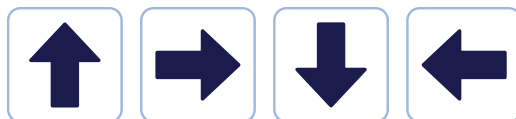
D 52

E 56

16

The arrow turns a quarter turn clockwise each time, and keeps going.

Which way does the 15th arrow point?



17

Here are some rectangles made of tiles.

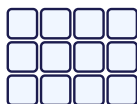
How many tiles will Pattern 4 have?



Pattern 1



Pattern 2



Pattern 3

A 18

B 20

C 16

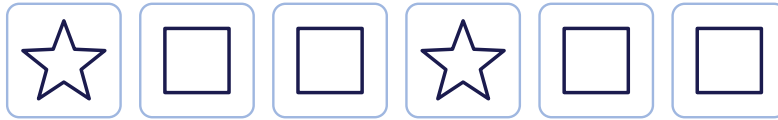
D 15

E 24

18

This pattern keeps repeating.

How many squares are there in the first 20 shapes?



A 7

B 12

C 10

D 14

E 13

## Part 2: Write your answer

19

Here are some patterns made of matchsticks.

How many matchsticks will Pattern 20 have?



Pattern 1



Pattern 2



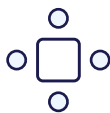
Pattern 3

Write your answer in the boxes on the answer sheet, one digit in each box.

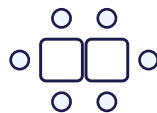
20

Square tables are pushed together in a row. Chairs go all the way round.  
30 people need a chair each.

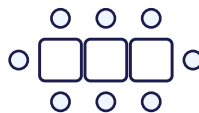
How many tables are needed?



Pattern 1



Pattern 2



Pattern 3

Write your answer in the boxes on the answer sheet, one digit in each box.

21

Here are some squares made of tiles.

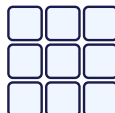
How many tiles will Pattern 9 have?



Pattern 1



Pattern 2



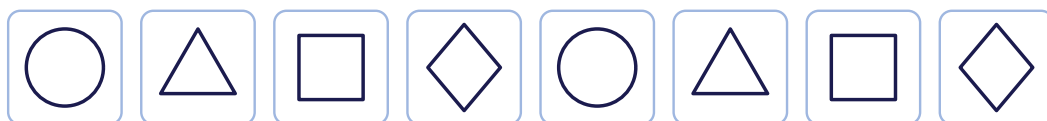
Pattern 3

Write your answer in the boxes on the answer sheet, one digit in each box.

22

This pattern keeps repeating.

How many diamonds are there in the first 30 shapes?

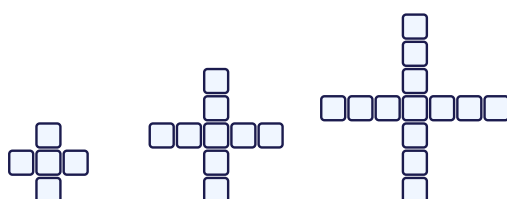


Write your answer in the boxes on the answer sheet, one digit in each box.

23

Here are some patterns made of tiles.

Which pattern uses exactly 49 tiles? Write the pattern number.



Pattern 1

Pattern 2

Pattern 3

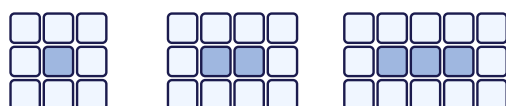
Write your answer in the boxes on the answer sheet, one digit in each box.

24

A garden path has grey tiles in a row, with white tiles all round.

A path uses 50 white tiles.

How many grey tiles does it have?



Pattern 1

Pattern 2

Pattern 3

Write your answer in the boxes on the answer sheet, one digit in each box.

# Answer sheet

11+ Maths Practice Paper · Year 5 · Lesson 5.2: Spatial and non-verbal sequences

Name .....

Draw a firm line through the box next to your answer, like the example.

## Part 1: Multiple choice

|           |                            |                            |                                       |                            |                            |
|-----------|----------------------------|----------------------------|---------------------------------------|----------------------------|----------------------------|
| <b>Ex</b> | A <input type="checkbox"/> | B <input type="checkbox"/> | C <input checked="" type="checkbox"/> | D <input type="checkbox"/> | E <input type="checkbox"/> |
| <b>1</b>  | A <input type="checkbox"/> | B <input type="checkbox"/> | C <input type="checkbox"/>            | D <input type="checkbox"/> | E <input type="checkbox"/> |
| <b>2</b>  | A <input type="checkbox"/> | B <input type="checkbox"/> | C <input type="checkbox"/>            | D <input type="checkbox"/> | E <input type="checkbox"/> |
| <b>3</b>  | A <input type="checkbox"/> | B <input type="checkbox"/> | C <input type="checkbox"/>            | D <input type="checkbox"/> | E <input type="checkbox"/> |
| <b>4</b>  | A <input type="checkbox"/> | B <input type="checkbox"/> | C <input type="checkbox"/>            | D <input type="checkbox"/> | E <input type="checkbox"/> |
| <b>5</b>  | A <input type="checkbox"/> | B <input type="checkbox"/> | C <input type="checkbox"/>            | D <input type="checkbox"/> | E <input type="checkbox"/> |
| <b>6</b>  | A <input type="checkbox"/> | B <input type="checkbox"/> | C <input type="checkbox"/>            | D <input type="checkbox"/> | E <input type="checkbox"/> |
| <b>7</b>  | A <input type="checkbox"/> | B <input type="checkbox"/> | C <input type="checkbox"/>            | D <input type="checkbox"/> | E <input type="checkbox"/> |
| <b>8</b>  | A <input type="checkbox"/> | B <input type="checkbox"/> | C <input type="checkbox"/>            | D <input type="checkbox"/> | E <input type="checkbox"/> |
| <b>9</b>  | A <input type="checkbox"/> | B <input type="checkbox"/> | C <input type="checkbox"/>            | D <input type="checkbox"/> | E <input type="checkbox"/> |
| <b>10</b> | A <input type="checkbox"/> | B <input type="checkbox"/> | C <input type="checkbox"/>            | D <input type="checkbox"/> | E <input type="checkbox"/> |
| <b>11</b> | A <input type="checkbox"/> | B <input type="checkbox"/> | C <input type="checkbox"/>            | D <input type="checkbox"/> | E <input type="checkbox"/> |
| <b>12</b> | A <input type="checkbox"/> | B <input type="checkbox"/> | C <input type="checkbox"/>            | D <input type="checkbox"/> | E <input type="checkbox"/> |
| <b>13</b> | A <input type="checkbox"/> | B <input type="checkbox"/> | C <input type="checkbox"/>            | D <input type="checkbox"/> | E <input type="checkbox"/> |
| <b>14</b> | A <input type="checkbox"/> | B <input type="checkbox"/> | C <input type="checkbox"/>            | D <input type="checkbox"/> | E <input type="checkbox"/> |
| <b>15</b> | A <input type="checkbox"/> | B <input type="checkbox"/> | C <input type="checkbox"/>            | D <input type="checkbox"/> | E <input type="checkbox"/> |
| <b>16</b> | A <input type="checkbox"/> | B <input type="checkbox"/> | C <input type="checkbox"/>            | D <input type="checkbox"/> | E <input type="checkbox"/> |
| <b>17</b> | A <input type="checkbox"/> | B <input type="checkbox"/> | C <input type="checkbox"/>            | D <input type="checkbox"/> | E <input type="checkbox"/> |
| <b>18</b> | A <input type="checkbox"/> | B <input type="checkbox"/> | C <input type="checkbox"/>            | D <input type="checkbox"/> | E <input type="checkbox"/> |

## Part 2: Write your answer, one digit in each box

|           |                      |                      |
|-----------|----------------------|----------------------|
| <b>19</b> | <input type="text"/> | <input type="text"/> |
| <b>20</b> | <input type="text"/> | <input type="text"/> |
| <b>21</b> | <input type="text"/> | <input type="text"/> |
| <b>22</b> | <input type="text"/> |                      |
| <b>23</b> | <input type="text"/> | <input type="text"/> |
| <b>24</b> | <input type="text"/> | <input type="text"/> |

# Answers

For a parent to mark with. One mark for each question: the paper is out of 24. Talk through any your child got wrong, using the explanation.

| Q  | Answer                                       | How to get it                                                                                                                                   |
|----|----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| 1  | D 5                                          | The patterns use 6, 11 and 16 matchsticks. A new hexagon shares one side, so it needs 5 more.                                                   |
| 2  | B 14                                         | Each new grey tile brings 2 white tiles, one above and one below: 8, 10, 12, then 14.                                                           |
| 3  | A an arrow pointing down                     | Each arrow turns an eighth of a turn clockwise: up, up and right, right, down and right, then down.                                             |
| 4  | E 3 times the pattern number, then add 1     | There is 1 matchstick on the left, then 3 for each square. Check: Pattern 2 is $3 \times 2 + 1 = 7$ .                                           |
| 5  | D 25                                         | Pattern 5 is 5 rows of 5: $5 \times 5 = 25$ . (The new parts go 3, 5, 7, 9: $16 + 9 = 25$ .)                                                    |
| 6  | C a square with the top right quarter shaded | The shaded quarter moves anticlockwise: top left, bottom left, bottom right, then top right.                                                    |
| 7  | E 42                                         | Each table has a chair on each side (2), and there is 1 chair at each end: $2 \times 20 + 2 = 42$ .                                             |
| 8  | A a circle                                   | The block circle, circle, triangle is 3 long. $20 \div 3 = 6$ remainder 2, so it is the 2nd shape of the block: a circle.                       |
| 9  | B 15                                         | Each new row is one dot longer: 1, 3, 6, 10, then $10 + 5 = 15$ .                                                                               |
| 10 | D 41                                         | The middle tile, then 4 for each pattern number: $4 \times 10 = 40$ , and $40 + 1 = 41$ .                                                       |
| 11 | B a hexagon                                  | Each shape has one more side, and the shapes take turns, dark then white. So next is a white shape with 6 sides.                                |
| 12 | C Pattern 13                                 | Undo the rule: take away the 1 extra, $40 - 1 = 39$ . Then $39 \div 3 = 13$ . It is Pattern 13.                                                 |
| 13 | A 4 dots                                     | There is one dot fewer each time: 6, 5, 4, 3, 2. The missing picture has 4 dots.                                                                |
| 14 | E 46                                         | 2 white tiles for each grey tile, and 3 more at each end: $2 \times 20 + 6 = 46$ .                                                              |
| 15 | A 51                                         | 1 matchstick on the left, then 5 for each hexagon: $5 \times 10 = 50$ , and $50 + 1 = 51$ .                                                     |
| 16 | D an arrow pointing down                     | Four quarter turns make a whole turn, so it repeats every 4 arrows. $15 \div 4 = 3$ remainder 3: it points the same way as the 3rd arrow, down. |
| 17 | B 20                                         | Pattern 4 is 4 rows of 5 tiles: $4 \times 5 = 20$ . (The new parts go 4, 6, then 8: $12 + 8 = 20$ .)                                            |
| 18 | E 13                                         | $20 \div 3 = 6$ remainder 2, so there are 6 whole blocks with $6 \times 2 = 12$ squares, and the last 2 shapes (star, square) have 1 more: 13.  |
| 19 | 41                                           | 1 matchstick to start, then 2 for each triangle: $2 \times 20 = 40$ , and $40 + 1 = 41$ .                                                       |
| 20 | 14                                           | Take away the 2 end chairs: $30 - 2 = 28$ . Each table has 2 more: $28 \div 2 = 14$ .                                                           |
| 21 | 81                                           | Pattern 9 is 9 rows of 9: $9 \times 9 = 81$ .                                                                                                   |

| Q  | Answer | How to get it                                                                                                                     |
|----|--------|-----------------------------------------------------------------------------------------------------------------------------------|
| 22 | 7      | $30 \div 4 = 7$ remainder 2. There are 7 whole blocks, each with 1 diamond, and the last 2 shapes are a circle and a triangle: 7. |
| 23 | 12     | Take away the middle tile: $49 - 1 = 48$ . Each pattern number adds 4: $48 \div 4 = 12$ . It is Pattern 12.                       |
| 24 | 22     | Take away the 6 end tiles: $50 - 6 = 44$ . Each grey tile has 2 white tiles: $44 \div 2 = 22$ .                                   |

**Score: ..... out of 24**